

FORM PTO-1390 (Modified)  
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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

## TRANSMITTAL LETTER TO THE UNITED STATES

09669/022001

DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

CONCERNING A FILING UNDER 35 U.S.C. 371

10/069341

INTERNATIONAL APPLICATION NO.  
PCT/FR00/02355INTERNATIONAL FILING DATE  
22 August 2000PRIORITY DATE CLAIMED  
24 August 1999

## TITLE OF INVENTION

DIVISIBLE MODULE CARD WHICH IS RESISTANT TO BENDING STRESSES

APPLICANT(S) FOR DO/EO/US

Franck GIROT and Eric LAVRUT

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4))
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information.

Copy of PCT/IB/308 (1 pg.)

Copy of first page of published WO 01/15077 A1 (1 pg.)

Copies of pages 3 and claims as amended in Article 34 Amendment (3 pages)

|   |              |                              |                          |                           |    |
|---|--------------|------------------------------|--------------------------|---------------------------|----|
| U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.01(a)(2))  |              | INTERNATIONAL APPLICATION NO |                          | ATTORNEY'S DOCKET NUMBER  |    |
| 10/069341   |              | PCT/FR00/02355               |                          | 09669/022001              |    |
| 24. The following fees are submitted:   |              |                              |                          | CALCULATIONS PTO USE ONLY |    |
| BASIC NATIONAL FEE ( 37 CFR 1.492 (a) (1) - (5)) :  |              |                              |                          |                           |    |
| <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO . . . . .                    |              |                              |                          | \$1040.00                 |    |
| <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO . . . . .   |              |                              |                          | \$890.00                  |    |
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| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) . . . . .  |              |                              |                          | \$710.00                  |    |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) . . . . .  |              |                              |                          | \$100.00                  |    |
| ENTER APPROPRIATE BASIC FEE AMOUNT =  |              |                              |                          | \$890.00                  |    |
| Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).  |              |                              |                          | \$0.00                    |    |
| CLAIMS  | NUMBER FILED | NUMBER EXTRA                 | RATE                     |                           |    |
| Total claims  | 10 - 20 =    | 0                            | x \$18.00                | \$0.00                    |    |
| Independent claims  | 1 - 3 =      | 0                            | x \$84.00                | \$0.00                    |    |
| Multiple Dependent Claims (check if applicable).  |              |                              | <input type="checkbox"/> | \$0.00                    |    |
| TOTAL OF ABOVE CALCULATIONS =   |              |                              |                          | \$890.00                  |    |
| <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2   |              |                              |                          | \$0.00                    |    |
| SUBTOTAL =  |              |                              |                          | \$890.00                  |    |
| Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).   |              |                              |                          | \$0.00                    |    |
| TOTAL NATIONAL FEE =  |              |                              |                          | \$890.00                  |    |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).   |              |                              | <input type="checkbox"/> | \$0.00                    |    |
| TOTAL FEES ENCLOSED =   |              |                              |                          | \$890.00                  |    |
|   |              |                              |                          | Amount to be: refunded    | \$ |
|   |              |                              |                          | charged                   | \$ |
| a. <input checked="" type="checkbox"/> A check in the amount of \$890.00 to cover the above fees is enclosed.   |              |                              |                          |                           |    |
| b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.  |              |                              |                          |                           |    |
| c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-0591 A duplicate copy of this sheet is enclosed.                |              |                              |                          |                           |    |
| d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. |              |                              |                          |                           |    |
| NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.   |              |                              |                          |                           |    |
| SEND ALL CORRESPONDENCE TO:   |              |                              |                          |                           |    |
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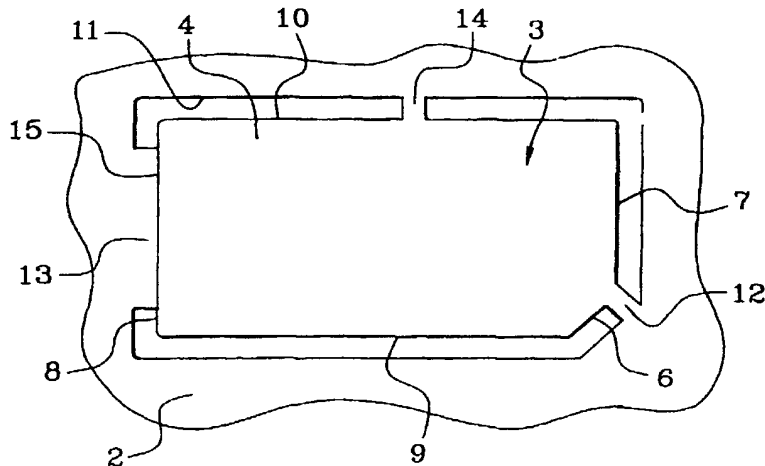
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[Suite sur la page suivante]

(54) Title: DIVISIBLE MODULE CARD WHICH IS RESISTANT TO BENDING STRESSES

(54) Titre: CARTE A MODULE SECABLE RESISTANTE AUX CONTRAINTES EN FLEXION



(57) Abstract: The invention relates to a card comprising a plastic card body (2) and a divisible module (3) which is fixed to said card body (2) by three links (12, 13, 14). Said divisible module (3) comprises a thin, essentially parallelepipedic and rectangular plastic module body (4), one of whose corner edges (6) is cut in such a way that it forms an element for preventing incorrect positioning; and a microcontroller which is electrically connected to contact pads (5) which are flush with the surface of the module (3). According to the invention, the card (1) is characterised in that a first link (12) connects the cut edge (6) of the module (3) for preventing incorrect positioning to the card body (2). The invention is particularly suitable for chip cards corresponding to the ISO format.

[Suite sur la page suivante]

WO 01/15077 A1

10059341/069341

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**Applicant :** GIROT Franck & LAVRUT Eric  
**Serial N° :**  
**Filed :**  
**Title :** Divisible Module Card Which Is Resistant To Bending Stresses

**Art Unit :**  
**Examiner :**

Assistant Commissioner for Patents  
Washington, DC 20231

**PRELIMINARY AMENDMENT**

Dear Sir:

Before examining the referenced application on the merits, please amend the application as outlined below:

**IN THE TITLE**

Please amend the title to read --Card With Snap-Off Module Resistant To Bending Stress--.

**IN THE SPECIFICATION**

1. On page 1, line 2, please insert the sub-heading --Field of the Invention-- above the paragraph which begins "The invention concerns..."
2. On page 1, line 8, please insert the sub-heading --Background of the invention-- above the paragraph that begins "Such cards, often called..."
3. On page 3, line 24, please insert the sub-heading --Summary of the invention-- above the paragraph begins "Also, a problem which the invention..."
4. On page 4, line 9, please insert the sub-heading --Brief Description of the Drawings-- above the paragraph that begins "It will be easier to understand..."
5. On page 4, line 19, please insert the sub-heading --Detailed Description-- above the paragraph that begins "The cards 1 according to the invention ..."
6. On page 3, line 27, please delete the term "of which on edge in".

7. On page 4, line 1, please replace the terms "the corner is cut" by the new terms "having a beveled edge".
8. On page 5, line 11, please insert the sentence --"So this edge is a beveled edge."-- just before the terms "In the remainder..."
9. On page 5, line 12, please replace the term "this" by the new terms "the bevelled"
10. On page 3, line 26, please replace the terms "by three ties" by the new terms "by a first and a second lateral tie"
11. On page 4, lines 7, please replace the terms "a first tie connects the cut foolproofing" by the new terms "the snap-off module is in addition held to the said card body by an angular tie, the said angular tie connecting the bevelled"
12. On page 9, please insert --What is claimed is:-- after the heading "CLAIMS".

### IN THE CLAIMS

Please amend the claims as outlined below. A marked-up version, illustrating the changes, of the claims is attached as Appendix A.

1. (Amended) A card comprising a plastic card body and a snap-off module held to the plastic card body by a first and a second lateral tie, this snap-off module comprising, firstly, a substantially rectangular thin plastic body having a bevelled edge so as to form a means of foolproofing and, secondly, a microcontroller electrically connected to contact pads flush with the surface of the said module, wherein the snap-off module is in addition held to the said card body by an angular tie, the said angular tie connecting the bevelled edge of the module to the card body.
2. (Amended) The card according to claim 1, wherein the snap-off module is held to the card body only by three ties.
3. (Amended) The card according to claim 1, wherein the first lateral tie connects the width edge of the module opposite the bevelled edge to the card body along almost all of the said width edge.
4. (Amended) The card according to claim 1, wherein the second lateral tie connects the length edge of the module opposite the bevelled edge to the card body.

5. (Amended) The card according to claim 4, wherein the second lateral tie is substantially centred along the length edge.
6. (Amended) The card according to claim 1, wherein the angular tie connects the top part of the bevelled edge (6) to the card body (2).
7. (Amended) The card according to claim 1, wherein the angular tie is perpendicular to the bevelled edge.
8. (Amended) The card according to claim 1, wherein the angular tie and second lateral tie are ties of reduced width measuring approximately one millimetre whose longitudinal cross section is constant, rectangular.
9. (Amended) The card according to claim 1, wherein the angular tie and the second lateral tie are extended towards the card body.
10. (Amended) The card according to claim 1, wherein the first lateral tie connects the width edge of the module opposite the bevelled edge to the card body and in that the second lateral tie connects the length edge of the module opposite the bevelled edge to the card body.

#### **IN THE ABSTRACT**

On page 11, line 12, please delete "Figure 4".

#### **Remarks**

The amendments to the specification and the claims are made to conform to the requirements for patent applications in the United States. No new matter was introduced by such amendments. Favourable consideration of this application is respectfully requested.

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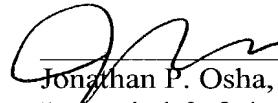
U.S. PATENT APPLICATION NO. [Unknown]  
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Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 09669/022001).

Respectfully submitted,

Date: \_\_\_\_\_

*01/26/02*



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**APPENDIX A – MARKED-UP VERSION OF THE CLAIMS**

1. ~~Card~~ A card (1) comprising a plastic card body (2) and a snap-off module (3) held to the ~~said plastic~~ card body (2) by a first (13) and a second (14) lateral tie, this snap-off module (3) comprising, firstly, a substantially rectangular thin plastic body (4) of ~~which one edge (6) in the corner is cut~~ having a bevelled edge so as to form a means of foolproofing and, secondly, a microcontroller electrically connected to contact pads (5) flush with the surface of the said module (3), ~~characterised in that~~ wherein the snap-off module (3) is in addition held to the said card body (2) by an angular tie (12), the said angular tie (12) connecting the ~~cut foolproofing~~ bevelled edge (6) of the module (3) to the card body (2).
11. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the snap-off module (3) is held to the card body only by three ties (12, 13, 14).
12. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the first lateral tie (13) connects the width edge (8) of the module (3) opposite the ~~cut~~ bevelled edge (6) to the card body (2) along almost all of the said width edge (8).
13. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the second lateral tie (14) connects the length edge (10) of the module (3) opposite the ~~cut~~ bevelled edge (6) to the card body (2).
14. ~~Card~~ The card (1) according to claim 4, ~~characterised in that~~ wherein the second lateral tie is substantially centred along the length edge (10).
15. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the angular tie connects the top part of the ~~cut~~ bevelled edge (6) to the card body (2).
16. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the angular tie (12) is perpendicular to the cut foolproofing edge (6).
17. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the angular tie (12) and second lateral tie (14) are ties of reduced width measuring approximately one millimetre whose longitudinal cross section is constant, rectangular.



18. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the angular tie (12) and the second lateral tie (14) are extended towards the card body (2).
19. ~~Card~~ The card (1) according to claim 1, ~~characterised in that~~ wherein the first lateral tie (13) connects the width edge (8) of the module (3) opposite the ~~cut~~ feelproofing bevelled edge (6) to the card body (2) and in that the second lateral tie (14) connects the length edge (10) of the module (3) opposite the ~~cut~~ bevelled edge (6) to the card body (2).

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10/069341

JC10 Rec'd PCT/PTO 22 FEB 2002

PATENT  
ATTORNEY DOCKET NO 09669/022001

**APPLICATION**  
**FOR**  
**UNITED STATES LETTERS PATENT**

**TITLE:           DIVISIBLE MODULE CARD WHICH IS  
RESISTANT TO BENDING STRESSES**

**APPLICANT:    Franck GIROT and Eric LAVRUT**

**"EXPRESS MAIL" Label No.: EV049243731US**

**Date of Deposit: 22 February 11, 2002**

**DIVISIBLE MODULE CARD WHICH IS RESISTANT TO BENDING STRESSES**

This invention concerns cards with a plastic body and a snap-off module held to the said card body by three ties, this snap-off module including, firstly, a substantially rectangular thin plastic body of which one edge in the corner is cut so as to form a means of foolproofing and, secondly, a microcontroller electrically connected to contact pads flush with the surface of the said module.

Such cards, often called SIM (Subscriber Identification Module) cards, are mainly intended for the field of mobile telephony where telecommunication network operators demand that the access to the services they propose is only possible through the use of a secured system. In practice, when a member of the public wants to access a telecommunication network, he first purchases a SIM card. This person is then known as a subscriber to the network and has for example access rights which are partly managed by the card.

Once the person has purchased a SIM card, he connects this card to his mobile telephone. Some mobile telephones only accept cards in ISO format, i.e. whose dimensions, approximately 85.6 mm long, 54 mm wide and 0.76 mm thick, are provided for in the standard ISO7816. Other mobile telephones however only accept SIM cards in mini-card format, i.e. whose dimensions, approximately 25 mm long, 15 mm wide and 0.76 mm thick, are provided for in the standard ETSI/GSM11.11. Consequently, depending on the model of mobile telephone that the subscriber has, he may need to detach the snap-off module from the card body in order to insert it in his telephone.

In the prior art shown on figures 1 and 2, module 3 is built into the card body 2 such that the contact pads 5 flush with the surface of the said module 3 are located at the positions defined in the above-mentioned standard ISO7816. The means intended to hold the module

3 to the card body 2 consist of four ties. A large tie 13 connects the width edge opposite the edge in the corner 6 cut so as to form a means of foolproofing, i.e. on the above-mentioned figures the left edge of module 3, to the card body 2 and three ties of reduced width 20, 21 and 5 22 connect respectively the top edge, the bottom edge and the right edge of the module 3, to the said card body 2. The longitudinal cross-section of these last three ties is highly trapezoidal.

To detach module 3 from a card, the person must exert pressure on the module in order to break the ties of reduced size 20, 21, 22 then 10 bend one or more times the large tie 13 to finally break it. Separation of module 3 is irreversible.

The cards with snap-off module described above in the state of the art technology do not have sufficient mechanical resistance to the dynamic flexions and torsions for them to comply with standards 15 ISO7816-1/ISO10373 which require that cards in ISO format must withstand 500 flexions in the direction of the length with a deflection of 20 mm (figure 3A) then 500 flexions in the direction of the width with a deflection of 10 mm (figure 3B). In fact, when such cards are subject to 500 dynamic flexions in the direction of the length, tie 22 undergoes a 20 maximum elongation of approximately 100 % and, when these cards are subject to 500 dynamic flexions in the direction of the width, tie 21 undergoes a maximum elongation of approximately 181 %. A maximum elongation of 100 % for a given tie means that part of this tie suffers a theoretical maximum elongation consistent with its length being 25 doubled. In practice, the tie snaps before reaching the 500 flexions.

Moreover, in spite of the fact that they offer insufficient resistance to the flexions and torsions, the snap-off modules of the cards using the state of the art technology are no easier to detach from the card body considering the presence of four ties.

5 We may also mention the patent application EP 0 521 778 A1 which concerns the manufacture of smartcards. To reduce the cost of manufacturing smartcards in smaller format than usual, all manufacturing steps including the testing and the printed personalisation of the visible surfaces of the card are carried out on a card of standard format. At the end of the process a card of  
10 reduced format is blanked from the standard card. A partial pre-cut is made along a line, either by thinning the card all around the perimeter of the reduced format card, or by a slit following this perimeter, this slit being interrupted locally to leave temporary supporting bridges between the reduced format card and the remainder of the standard card.

15 Patent DE 0 535 436 A2 concerns a smartcard including a detachable module. This module is connected to the card body by ties and at least one attachment element. When the ties are broken, the module keeps the same position in its housing due to the attachment element.

Patent DE 197 26 203 C1 concerns a smartcard including a card body in  
20 which there is a substantially rectangular and irreversibly detachable module. The limit between the card body and the module is cut around virtually all the perimeter. The part of the contour which is not cut is a line which is scored slightly. Opposite this scored linear area there is a triangular notch.

Also, a problem which the invention proposes to solve concerns the  
25 realisation of cards with a plastic card body and a snap off module held to the said card body by three ties, this snap-off module including, firstly, a substantially rectangular thin plastic body of which one edge in

the corner is cut so as to form a means of foolproofing and, secondly, a microcontroller electrically connected to contact pads flush with the surface of the said module, the said cards offering greater resistance to stresses under flexion and under torsion than the similar cards in the state of the art technology.

The proposed solution of the invention to the above-mention problem concerns a card characterised in that a first tie connects the cut foolproofing edge of the module to the card body.

It will be easier to understand the invention on reading the non limiting description below, written with reference to the accompanying drawings, where:

figure 1 shows, in perspective, a card according to the prior art;

figure 2 details, in plan view, a snap-off module of a card according to the prior art;

figures 3A and 3B schematise, in cross section, the flexion tests provided for by the standard ISO7816-1/ISO10373; and

figures 4, 5 and 6, detail, in plan view, three modes of realisation of a snap-off module of a card according to the invention.

The cards 1 according to the invention have a card body 2 and a module 3.

The body 2 of a card according to the invention is conform with the body 2 of cards according to the prior art, as shown on figure 1. It therefore forms substantially a thin right parallelepiped whose dimensions, defined in standard ISO7816 whose content is incorporated in this description by giving the reference, are approximately 85.6 mm long, 54 mm wide and 0.76 mm thick. It is plastic, especially thermoplastic for example formed from a polyvinyl chloride (PVC), an acrylonitrile butadiene styrene (ABS) a polyethylene terephthalate (PET) a polycarbonate (PC) or a mixture of these thermoplastics. It generally has a multilayer structure, the various layers being welded or glued together during known methods used to manufacture cards including in particular hot roll bonding.

Module 3 is a snap-off module. It includes, firstly, a module body 4 and, secondly, a microcontroller electrically connected to contact pads 5 flush with the surface of the said module 3.

The characteristics of the module body 4 are defined especially in  
5 standard ETSI/GSM11.11. It forms substantially a thin right  
parallelepiped whose dimensions are approximately 25 mm long, 15  
mm wide and 0.76 mm thick, i.e. the same thickness as that of the card  
body 2. One edge at the corner of the module is cut off at 45° so as to  
form a means of foolproofing for its positioning in the sense recto-verso  
10 during connection to the electrical terminals of a connector on a  
terminal provided for this purpose. In the remainder of this description  
this edge is referred to as cut edge 6. The width edge of module 3, in  
direct continuity with cut edge 6, is the right edge 7 of module 3. The  
width edge of module 3, opposite the cut edge 6, is the left edge 8 of  
15 module 3. The length edge of module 3, in direct continuity with cut  
edge 6, is the bottom edge 9 of module 3. The length edge of module 3,  
opposite the cut edge 6, is the top edge 10 of module 3.

Like the card body 2, the module body 4 is made from plastic, especially thermoplastic for example formed from a PVC, an ABS a PET, a PC or a mixture of these thermoplastics. It generally has a multilayer structure, the various layers being welded or glued together during known methods used to manufacture cards. In practice, the module body 4 is identical, as regards its thickness and the chemical materials composing it, to the card body 2. This results from the fact that, to manufacture the card according to the invention, a classical card is manufactured and then a punched cut 11 is made which partially separates the module 3 from the card body 2. This punched cut 11 has a constant width of approximately 1 mm. It is obtained through the use of punching tools.

According to the invention, module 3 is held to the card body 2 by three ties and, advantageously, by three ties only. A first tie 12 connects the cut edge 6 of the module 3 to the card body 2, a second tie 13 connects the left edge 8 of the module 3 to the card body 2 and a third tie 14 connects the top edge 10 of the module 3 to the said card body.

The second tie 13 connects the left edge 8 of the module 3, along almost all of the said edge 8. In practice, this tie 13 is centred along edge 8 and has a length of between 10 and 11 mm. On the top side of the card which has the contact pads, it has a score 15 which simplifies the breaking of the said tie 13 when the module 3 is to be detached.

The first 12 and third 14 ties are ties of reduced width. In practice, their width is approximately one millimetre. Their cross section in the longitudinal direction is for example trapezoidal or constant, rectangular.

In the mode of realisation of the invention shown on figure 4, the ties have the following characteristics.

The first tie 12 connects the top part of the cut edge 6 to the card body 2. It is perpendicular to the said edge 6. Its width is approximately one millimetre and its longitudinal cross section is constant rectangular or slightly trapezoidal.



The second tie 13 is substantially centred along edge 8 and has a length of approximately 12 mm. It has a cut 15.

The third tie 14 is substantially centred along the top edge 10. It is perpendicular to the said edge 10. Its width is approximately one  
5 millimetre and its longitudinal cross section is constant rectangular or slightly trapezoidal.

Equipped with such ties, module 3 of the above-mentioned mode of realisation displays, when it is subject to 500 dynamic flexions in the direction of the length (figure 3A), a maximum elongation of  
10 approximately 15 % on the first tie 12 and, when it is subject to 500 dynamic flexions in the direction of the width (figure 3B), a maximum elongation of approximately 21 % on the third tie 14. These maximum elongations are not sufficient to cause the thermoplastic ties concerned to break. A card whose module is equipped with ties according to this  
15 mode of realisation therefore withstands the 500 dynamic flexions in the direction of the length and in the direction of the width required by the standard ISO7816-1/DIN10373.

Note that if, with respect to the mode of realisation on figure 4, the first tie 12 does not connect the cut edge 6 to the card body 2, but the  
20 right edge 7 to the said body 2, the maximum elongation, which was approximately 15 % on this first tie 12 reaches a value of 33 %.

In the mode of realisation of the invention shown on figure 5, the ties 12, 13, 14 have the same characteristics as the ties 12, 13, 14 of the mode of realisation on figure 4, apart from the first tie 12 which this  
25 time is parallel to the bottom 9 and top 10 edges of the module 3.

In this mode of realisation, card 1 displays, when it is subject to 500 dynamic flexions in the direction of the length, a maximum elongation of approximately 20 % on the first tie 12 and, when it is  
30 subject to 500 dynamic flexions in the direction of the width, a maximum elongation of approximately 22 % on the third tie 14. As previously, these maximum elongations are not sufficient to cause the ties 12, 14 concerned to break. A card 1 according to the invention,

whose module is equipped with ties described above, therefore withstands the 500 dynamic flexions in the direction of the length and in the direction of the width required by the standard ISO7816-1/ISO10373.

5 In the mode of realisation of the invention shown on figure 6, the ties 12, 13, 14 have the same characteristics as the ties 12, 13, 14 of the mode of realisation of figure 5, apart from the fact that the first 12 and third 14 ties are extended towards the card body 2, since the said body 2 has at the position of the said ties 12, 14 a notch 16 which has a  
10 depth of approximately 1 mm.

In this mode of realisation, card 1 displays, when it is subject to 500 dynamic flexions in the direction of the length, a maximum elongation of approximately 16 % on the first tie 12 and, when it is subject to 500 dynamic flexions in the direction of the width, a  
15 maximum elongation of approximately 15 % on the third tie 14. These maximum elongations are not sufficient to cause the ties 12, 14 concerned to break. A card 1 according to the invention, whose module 3 is equipped with ties 12, 14 described above, therefore withstands the 500 dynamic flexions in the direction of the length and in the direction  
20 of the width required by the standard ISO7816-1/ISO10373.

Note that, if the ties are extended towards module 3, i.e. if it is module 3 which has notches like the notches 16, the aforementioned value of 15 % becomes 71 %, which is considerable.

In conclusion, compared with the state of the art, the fact of having  
25 a first tie 12 connected directly to the cut edge 6 considerably improves the resistance of the card to the dynamic flexions. Moreover, the presence of this tie limits the opening of module 3 with respect to the card body 2 during the flexions in the direction of the length, openings which could lead to a relative deformation of module 3 with respect to  
30 the card body 2 and prevent the correct insertion and withdrawal of the card 1 in read terminals for ISO format cards.

CLAIMS

1. Card (1) comprising a plastic card body (2) and a snap-off module (3)  
held to the said card body (2) by a first (13) and a second (14) lateral tie,  
5 this snap-off module (3) comprising, firstly, a substantially rectangular  
thin plastic body (4) of which one edge (6) in the corner is cut so as to  
form a means of foolproofing and, secondly, a microcontroller electrically  
connected to contact pads (5) flush with the surface of the said module  
(3), characterised in that the snap-off module (3) is in addition held to  
10 the said card body (2) by an angular tie (12), the said angular tie (12)  
connecting the cut foolproofing edge (6) of the module (3) to the card  
body (2).
2. Card (1) according to claim 1, characterised in that the snap-off module  
(3) is held to the card body only by three ties (12, 13, 14).
- 15 3. Card (1) according to claim 1, characterised in that the first lateral tie  
(13) connects the width edge (8) of the module (3) opposite the cut edge  
(6) to the card body (2) along almost all of the said edge (8).
4. Card (1) according to claim 1, characterised in that the second lateral  
tie (14) connects the length edge (10) of the module (3) opposite the cut  
20 edge (6) to the card body (2).
5. Card (1) according to claim 4, characterised in that the second lateral  
tie is substantially centred along edge (10).
6. Card (1) according to claim 1, characterised in that the angular tie  
connects the top part of the cut edge (6) to the card body (2).
- 25 7. Card (1) according to claim 1, characterised in that the angular tie (12)  
is perpendicular to the edge (6).
8. Card (1) according to claim 1, characterised in that the angular tie (12)  
and second lateral tie (14) are ties of reduced width measuring  
approximately one millimetre whose longitudinal cross section is  
30 constant, rectangular.

9. Card (1) according to claim 1, characterised in that the angular tie (12) and the second lateral tie (14) are extended towards the card body (2).

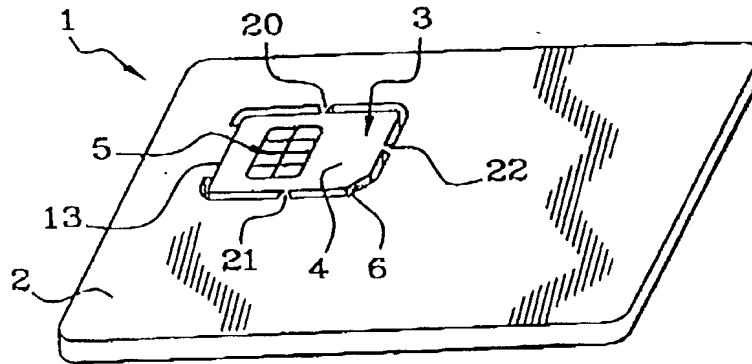
10. Card (1) according to claim 1, characterised in that the first lateral tie (13) connects the width edge (8) of the module (3) opposite the cut foolproofing edge (6) to the card body (2) and in that the second lateral tie (14) connects the length edge (10) of the module (3) opposite the cut edge (6) to the card body (2).

11  
ABSTRACT

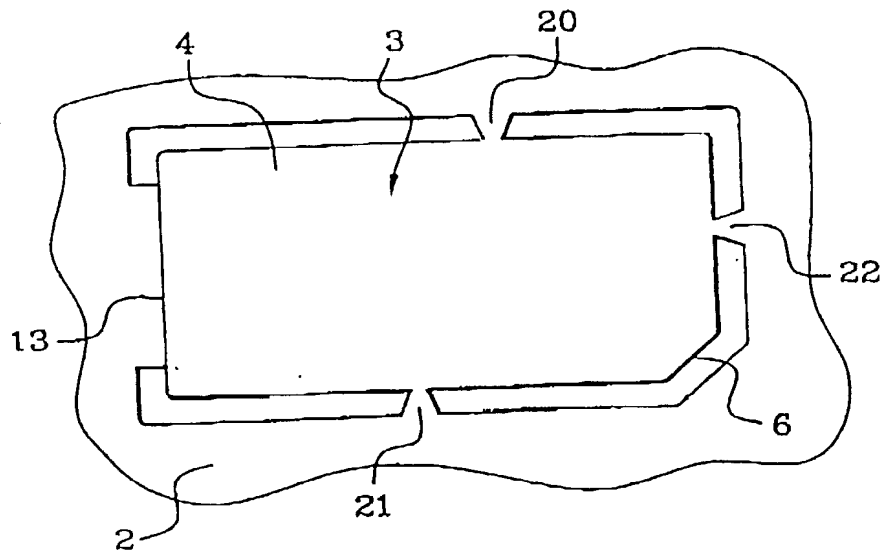
This invention concerns a card with a plastic card body (2) and a snap-off module (3) held to the said card body (2), by three ties (12, 13, 14), this snap-off module (3) including, firstly, a substantially rectangular thin plastic body (4) of which one edge (6) in the corner is cut so as to form a means of foolproofing and, secondly, a microcontroller electrically connected to contact pads (5) flush with the surface of the said module (3). The card (1) according this invention is characterised in that a first tie (12) connects the cut foolproofing edge (6) of the module (3) to the card body (2). The invention applies in particular to ISO format smartcards.

Figure 4

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ART ANTERIEUR  
**FIG.1**



ART ANTERIEUR  
**FIG.2**

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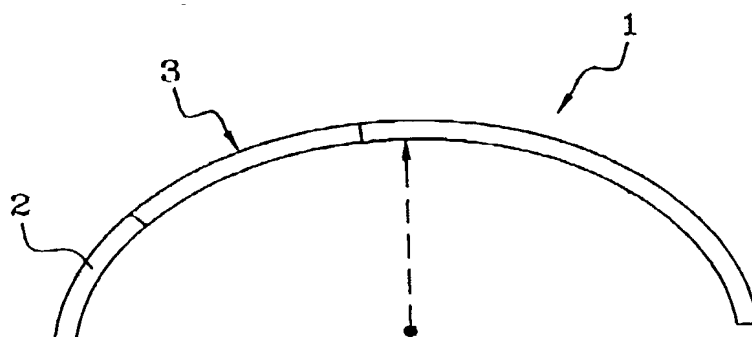


FIG. 3A

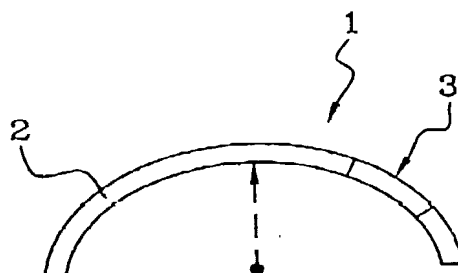
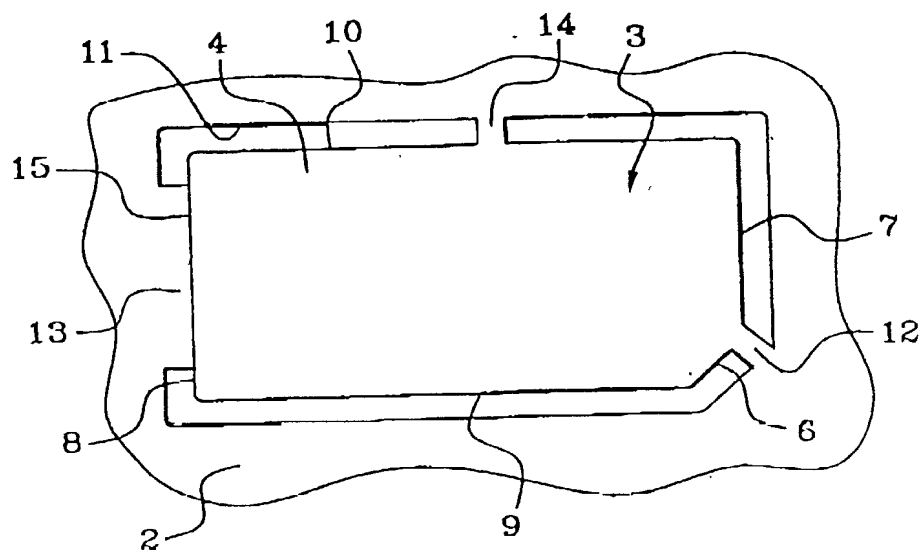
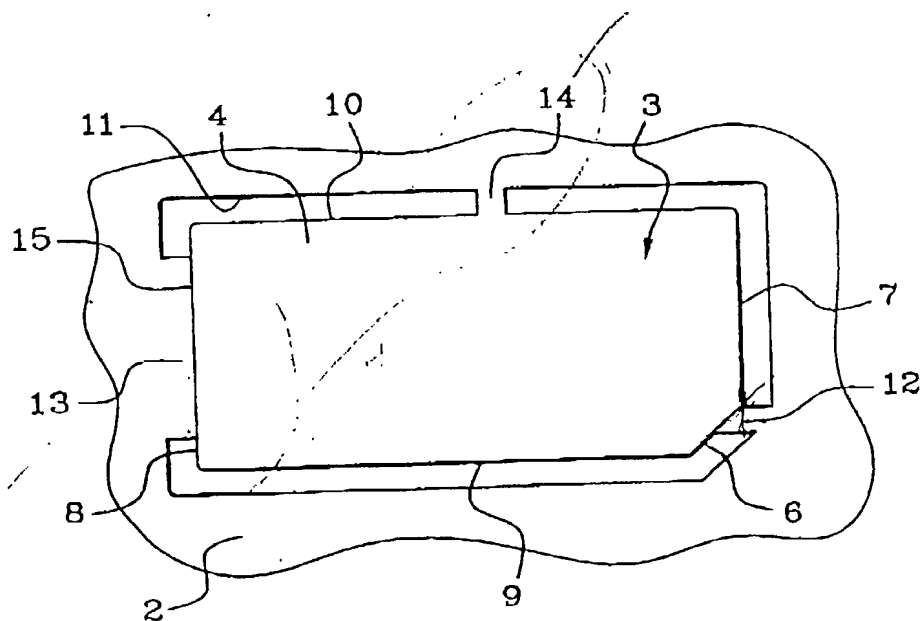


FIG. 3B

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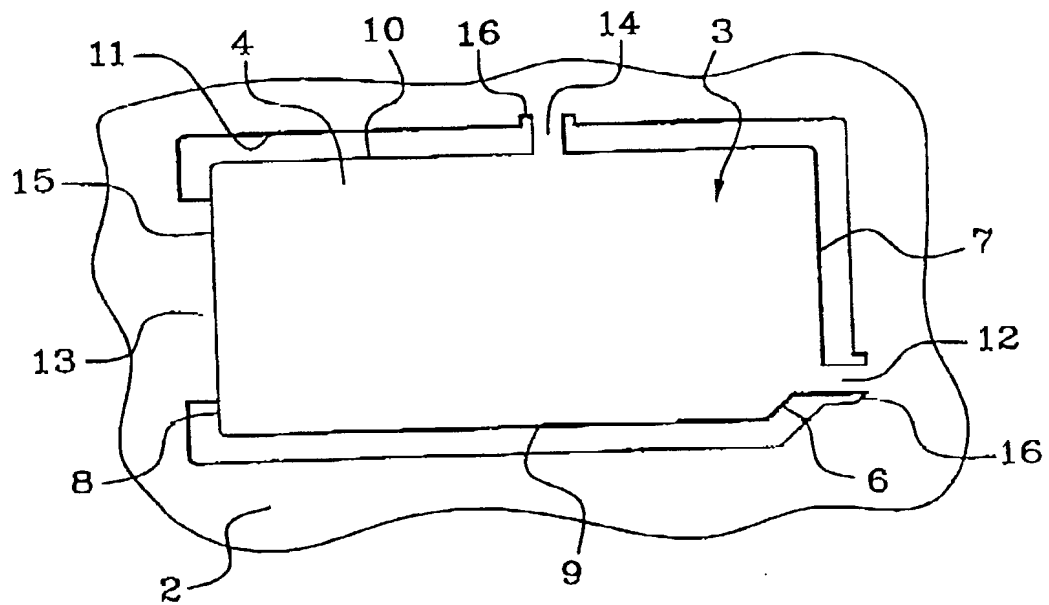


**FIG. 4**



**FIG. 5**





**FIG. 6**

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# DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted with Initial Filing

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Attorney Docket Number

09669/022001

First Named Inventor

Eric LAVRUT

## COMPLETE IF KNOWN

Application Number

10 / 069, 341

Filing Date

February 22, 2002

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CARD WITH SNAP-OFF MODULE RESISTANT TO BENDING STRESS.

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY)

02/ 22/ 2002

as United States Application Number or PCT International

Application Number

10/069, 341

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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

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☐ A petition has been filed for this unsigned inventorGiven Name  
(first and middle [if any])

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LAVRUT

Inventor's  
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Date

19/04/02

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
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| <b>Filing Date</b>            | February 22, 2002      |
| <b>First Named Inventor</b>   | Eric LAVRUT            |
| <b>Title</b>                  | Card with Snap-Off ... |
| <b>Group Art Unit</b>         |                        |
| <b>Examiner Name</b>          |                        |
| <b>Attorney Docket Number</b> | 09669/022001           |

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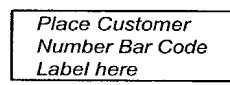
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Name

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Date

19/04/02

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